

Regularization/R (Q7L8)

30% (6/20)

- ✗ 1. In Poisson regression...
- ☐ A The asymptotic distribution of the maximum likelihood estimates is multivariate normal.
 - ☐ B The distribution of the maximum likelihood estimates is multivariate normal.
 - ☐ C The asymptotic distribution of the maximum likelihood estimates is multivariate Poisson distribution.
 - ☐ D I do not know
- ✓ 2. In the case of intercept-only model
- ☒ A The mean of the dependent variable equals the exponential value of intercept
 - ☐ B The mean of the dependent variable equals the intercept
 - ☐ C The mean of the dependent variable equals 0
 - ☐ D I do not know
- ✗ 3. $\ln(\lambda) = 0.6 - 0.2 \cdot \text{female}$ [λ = the average number of articles] Note: $e^{(-0.2)}=0.78$
- ☒ A One unit increase in female brings a 0.2 decrease in $\ln(\lambda)$.
 - ☐ B Being female decreases the average number of articles by 0.78 percent
 - ☐ C Being female decreases the average number of articles by 22%
 - ☐ D I do not know
- ✗ 4. In the multiple linear regression, we assume that...
- ☐ A The number of observations is much larger than the number of variables ($n \gg p$)
 - ☐ B The number of observations is slightly larger than the number of variables ($n > p$)
 - ☐ C The number of observations equals than the number of variables ($n = p$)
 - ☐ D The number of observations is less than the number of variables ($n < p$)
 - ☐ E It is not important
 - ☐ F I do not know

- ✗ 5. The way of solving the problem of a large number of variables is...
- ☐ A Subset Selection & Shrinkage (Regularization)
 - ☐ B Shrinkage (Regularization) & Maximum Likelihood estimation
 - ☐ C Dimension Reduction & OLS estimation
 - ☐ D I do not know
 - ☐ E The absence of the right answer
- ✗ 6. The bias of an estimator (e.g. \hat{z}) equals...Hint: the OLS coefficients are unbiased :)
- ☐ A $E(\hat{z}) - z$
 - ☐ B $E(\hat{z}^2) - [E(z)]^2$
 - ☐ C $[E(\hat{z}^2) - E(z)]^2$
 - ☐ D $E(\hat{z}^2)$
 - ☐ E I do not know
- ✗ 7. The main idea of regularization is
- ☐ A To introduce a small amount of bias in order to have less variance.
 - ☐ B To introduce a small amount of variance in order to have less bias.
 - ☐ C To introduce a small amount of variance and bias in order to have less bias.
 - ☐ D I do not know
- ✗ 8. With which function we can show regularization in R
- ☐ A `glmnet()`
 - ☐ B `regular()`
 - ☒ C `lm()`
 - ☐ D `glm()`
 - ☐ E I do not know
- ✗ 9. How the tune of any parameter can be made
- ☐ A using Cross validation
 - ☐ B It is impossible
 - ☐ C I do not now
 - ☐ D using larger sample
 - ☐ E only having population

- ✗ 10. Elastic Net is
- ☐ A the combination of L1 and L2 regularization
 - ☐ B the combination of L2 and L3 regularization
 - ☐ C is independent from other types of regularization
 - ☐ D I do not know
 - ☐ E not a type of regularization

- ✗ 11. Regularization is used only for
- ☒ A Poisson Regression
 - ☐ B Linear Regression
 - ☐ C Logistic Regression
 - ☐ D any regression
 - ☐ E I do not know

- ✗ 12. Regularization can solve the problem of
- ☒ A heteroscedasticity
 - ☐ B multicollinearity
 - ☐ C autocorrelation
 - ☐ D I do not know

- ✓ 13. As a result of regularization we will have
- ☒ A smaller slope than in case of OLS
 - ☐ B larger slope than in case of OLS
 - ☐ C the slope remains the same
 - ☐ D I do not know

- ✗ 14. The ridge coefficient estimates shrink towards zero
- ☐ A when lambda increases
 - ☒ B when lambda decreases
 - ☐ C when $\lambda = 0$
 - ☐ D I do not know

✓ 15. Which one can shrink the slope all the way to 0?

- ☒ A Lasso
- ☐ B Ridge
- ☐ C Regression
- ☐ D I do not know

✓ 16. When $\lambda = 0$, we have

- ☐ A Ridge
- ☐ B Lasso
- ☐ C EL
- ☒ D Regression
- ☐ E I do not know

✗ 17. When $\alpha = 0$, we have

- ☐ A Ridge
- ☐ B Lasso
- ☐ C EL
- ☐ D Regression
- ☐ E I do not know

✗ 18. ...variables need to be incorporated in the model according to domain knowledge...

This statement is true for...

- ☐ A Ridge
- ☐ B Lasso
- ☐ C EL
- ☐ D Regression
- ☐ E I do not know

✓ 19. Which function can help to perform cross-validation for regularization in R?

- ☒ A `cv.glmnet()`
- ☐ B `cros_val()`
- ☐ C `glmnet(method = "cv")`
- ☐ D I do not know



20. Why we use `set.seed()` in R?

- ☒ A To have universal result
- ☐ B To perform better result
- ☐ C To have random models
- ☐ D I do not know